

 <p align="center">Financial Assistance Award</p> <p align="center">DENALI COMMISSION 510 L Street, Suite 410 Anchorage, Alaska 99501 (907) 271-1414 (phone) (907) 271-1415 (fax) www.denali.gov</p>		Award Number	01222-00		
		Award Title	Psychrophiles for Generating Heating Gas		
		Performance Period	October 16, 2009 through September 30, 2011		
Authority 112 Stat 1854		CFDA Number 90.100		Recipient Organization & Address University of Alaska Fairbanks PO BOX 757880 3295 COLLEGE ROAD 109 ASC Fairbanks, AK 99775-7880 Phone: (907) 474-6264 Recipient DUNS # 615245164 TIN # 926000147	
Denali Commission Finance Officer Certification		Jennifer Price 02/25/2010			
Cost Share Distribution Table					
Accounting Code	New Funding		Prior Period Funding		Total
	Denali Commission	Other Contributors	Denali Commission	Other Contributors	
95670000AL	\$250,910.00		\$0.00		\$250,910.00
	\$0.00		\$0.00		\$0.00
	\$0.00		\$0.00		\$0.00
	\$0.00		\$0.00		\$0.00
	\$0.00		\$0.00		\$0.00
UAF Match		\$16,312.00		\$0.00	\$16,312.00
CEC Match		\$79,790.00		\$0.00	\$79,790.00
		\$0.00		\$0.00	\$0.00
		\$0.00		\$0.00	\$0.00
		\$0.00		\$0.00	\$0.00
Total	\$250,910.00	\$96,102.00	\$0.00	\$0.00	\$347,012.00
This Financial Assistance Award approved by the Federal Co-Chair of the Denali Commission constitutes an obligation of federal funding.					
Award Conditions to the Financial Assistance Award Between the Denali Commission and University of Alaska Fairbanks, Alaska Center for Energy and Power For Psychrophiles for Generating Heating Gas, Award No. 01222					
Continued on the following pages.					
Signature of Authorized Official - Denali Commission		Typed Name and Title		Date	
Electronically Signed		Joel Neimeyer Federal Co-Chair		02/18/2010	

AWARD ATTACHMENTS

University of Alaska Fairbanks

01222-00

1. Award Conditions - Psychrophiles for Generating Heating Gas

***Award Conditions to the Financial Assistance Award
Between the Denali Commission and University of Alaska Fairbanks, Alaska
Center for Energy and Power
For Psychrophiles for Generating Heating Gas
Award No. 01222
December 2009***

1. Scope of Work

This award provides \$250,910 to the University of Alaska Fairbanks (UAF), Alaska Center for Energy and Power (ACEP) for the Psychrophiles for Generating Heating Gas project. In kind match funding from the UAF and Cordova Electric Cooperative is provided in the amount of \$96,102.

Project Budget

Denali Commission Total:		\$250,910
Cordova Electric Cooperative (CEC):	\$54,876	
UAF Applied Research:	\$196,034	
 Match Total:		 \$ 96,102
UAF Match:	\$16,312	
CEC Match:	\$79,790	
 Total Project Costs:		 \$347,012

In addition, a Blackstone-National Geographic award was funded in the amount of \$50,000 to provide outreach funds to take the technology developed in Alaska to other cold-climate regions in the world.

The following activities are allowable with Denali Commission funds:

CEC Materials (\$14,876)

Project equipment, including a gas flow meter, gas cook stove, gas heater, small generator, plumbing valves/fittings, and field supplies; feedstock supplies.

CEC Student Travel (\$40,000)

A requirement of the EETG initiatives includes outreach of lessons learned from testing new technology. Students will be providing volunteer labor for a majority of local operations and maintenance of the digesters to include feedstock processing, waste disposal, feedstock collection, etc. In return, the incentive of travel is for students to present the project and findings at conferences and venues throughout the state. This budget item allows for ten (10) students to travel to the Rural Energy Conference in Fairbanks in April 2010 and one other venue, such as the Alaska Power Association (APA) to present on the project. The project lasts two years and travel funding for ten

students over this time period on up to four trips is allowable. Denali Commission shall approve in writing the venue in advance.

CEC will provide computer support, staff salary, and construction materials as in-kind contributions to match the grant. The in kind value is estimated at \$79,790.

UAF/ACEP Applied Research (\$196,034)

- Collection and delivery of lake mud containing active methane-producing methanogens from a Fairbanks lake to Cordova.
- Acquisition of scientific supplies and some equipment for building digesters, sampling the experiment, and logging results with data loggers.
- Participate in design and implementation of the biogas reactor experiments Phase 1 (research), and in demonstrating the use of biogas in Phase 2 (application).
- Train Cordova participants and participate in the collection of field data and samples for laboratory analysis.
- Submit plans and analysis to CEC.
- Conduct to the analysis, interpretation, and presentation of results for the final report.
- Office/lab space including space to organize field sampling equipment, preparation of samples, analysis of gas samples, sample preparation, freeze drying, grinding and analysis on the isotope mass spectrometer.
- Freezers and walk-in refrigerators, warehouse and storage facility.
- Use of vehicles for the project in Fairbanks to acquire lake mud and experimental supplies and equipment.
- Use of vehicles to collect manure from an indoor dairy farm.
- Travel to and from Cordova with materials for the study.

Project Scope Detail

The project scope includes the applied research of the use of psychrophiles (cold loving microbes) to improve efficiency in biogas digesters for generating cooking and heating gas for Alaskan households. The first phase will compare the efficiencies of mesophiles (conventional digester microbes) and psychrophiles on common household and rural Alaska feedstock at various temperatures. The second phase will deploy digester(s) in practical household scale project(s) to operate appliances and an electrical generator to evaluate feasibility and sustainability in an applied setting for widespread use in Alaska.

During Phase 1 the digester vessels will be fitted with instrumentation, data loggers, and a gas collection system to measure the performance of various feed stocks at ambient outdoor and indoor temperatures. Both conventional mesophilic methanogens (from livestock manure) and psychrophiles (from thermokarst lake mud) will be tested for performance through seasonal temperature variations. The results will be evaluated and deployed in Phase 2 to construct and install a working prototype for performance

evaluation in a residential application (using appliances such as a gas cook stove, household gas space heater, and methane-powered electrical generator). The project results will be compiled into a final report that includes a technical evaluation of data, lessons learned, and recommendations for practical application of the technology for Alaskans.

During Phase I, Cordova High School science students, led by their teacher, Adam Low, will help set up, maintain, and monitor the experiments. They will collect, process, and apply feed stocks to the digesters, and properly dispose of liquid effluent. University of Alaska Fairbanks (UAF) staff will analyze and evaluate collected data and report results. Cordova Electric Cooperative (CEC) will assist in collecting or purchasing digester vessels, piping, and necessary equipment for Phase I activities, while UAF provides instrumentation, data loggers and a gas collection system.

Go/no go decisions will be made through mutual consent of the Denali Commission, ACEP and the CEC regarding Phase 2 scope and necessary data collection methods. It is expected that during Phase 2, Cordova High School science students will participate in the installation and monitoring of applied digester technology (appliances). They will participate in the collection and application of feed stocks to the digesters as in Phase I. UAF will analyze, evaluate, and report findings. CEC and UAF will procure appliances and supervise the relocation and set up of the applied digester technology, including instruction to participants.

Consistent with the goals of the emerging technology solicitation, lessons learned throughout this process will be presented by students to various audiences in Alaska. Travel funds for this purpose are allowable within the project budget with the consent of Denali Commission.

All Commission funding is intended for use for the scope of work identified in the Award document only. Any balance of funds remaining after the full scope of work has been completed will be returned to the Denali Commission.

2. *Milestones*

The following milestones are identified as the major steps to be completed as part of the project. "Planned" dates for the first milestone are included here. As part of each progress report, recipients shall update the progress toward meeting these milestones (see section 7, Reporting).

Milestone	Planned		Actual		Units	Total Cost At Completion
	Start Date	End Date	Start Date	End Date		
In-Progress	10/16/2009	09/30/2011			0	\$0.00
Project Close-out	10/01/2011	12/30/2011			0	\$0.00

3. Award Performance Period

The Award performance period is October 16, 2009 through September 30, 2011. This is the period during which Award recipients can incur obligations or costs against this Award.

4. Direct and Indirect Costs

The cost principles of OMB A-21 are applicable to this Award. Indirect costs up to 5% are allowable toward this project and funded through Award #1194. Please refer to the cost principles regulations for specific details on other allowable charges under this Award.

5. Budget and Program Revisions

The Administrative Circular, 2 CFR Part 215, applies to this Award. Please refer to the Administrative Circular for specific details on revisions to this Award. The Administrative Circular requires that ACEP will inform the Commission in writing (e-mail, letter, or report) at the earliest possible date of any unanticipated project cost overrun, project schedule delays, or changes in the project scope or changed site conditions.

6. Payments

Payments under this Award will be made by electronic transfer in response to a "Request for Advance or Reimbursement", Standard Form 270 (SF-270) submitted by ACEP. Requests for reimbursements may be made as needed. The SF-270 must be submitted to the Denali Commission via fax, e-mail (finance@denali.gov) or mail in order for payment to be processed. The form is available on the OMB website: http://www.whitehouse.gov/OMB/grants/grants_forms.html. Payments shall be made in accordance with 2 CFR Part 215. Please contact the Denali Commission's Finance Specialist at (907) 271-1414 for further information about submitting this form. **No interest will be accrued on these funds.**

7. Reporting

Two forms of project reporting are required under this Award, listed below. ACEP shall submit reports using the Denali Commission's on-line Project Database System, available at www.denali.gov. If there are technical limitations which may prevent the recipient from meeting this requirement, please contact the Program Manager listed in this agreement.

- a. **Progress Reports** shall be submitted on a quarterly basis. The first reporting period is October 16, 2009 to March 31, 2010 and quarterly thereafter. Reports are due within 30 days of the end of the reporting period. Progress reports shall include the following:

- i. Total project funding, including both Denali Commission funding and other project funding sources.
 - ii. The total project expenditures for the project as of the end of the reporting period, including both Denali Commission and Other funding sources.
 - iii. Updated schedule and milestone information as identified in the Scope of Work.
 - iv. Narrative summary of the project status and accomplishments to date, and address the following questions: is the project on schedule, is the project on budget, and what actions are planned to address any project problems.
 - v. For minor repair and renovation projects or other non-construction projects, pictures should be provided of before and after, or photos that are representative of the funded activity, to the extent possible. Photos shall be provided in a digital format as part of the on-line report. A short description of the activity and names of those in the photos shall also be provided.
- b. **Federal Single Audits** shall be submitted annually, when required. In accordance with OMB Circular A-133, which requires [subpart 200] “Non-Federal entities that expend \$500,000 or more in a year in Federal awards shall have a single or program-specific audit conducted for that year in accordance with the provisions of this part [subpart 205]. The determination of when an award is expended should be based on when the activity related to the award occurs.”

Recipients shall also submit single audits to the Federal Clearinghouse as designated by OMB. Information can be found on the following web-site:
<http://harvester.census.gov/sac/>

8. *Project/Award Close-Out*

The project close-out report shall be completed within 90 days of the end of the Award performance period or within 90 days of the completion of the project, whichever is earlier. Recipients must also draw down any remaining funds for expenditures incurred under this award during this 90-day period.

The project close-out report shall be submitted on-line through the Denali Commission's on-line Project Database System, available at www.denali.gov. The project close out will require the recipient to submit the following information:

- a. Final data for each item listed in paragraph 7(a) “Progress Reports”.
- b. Final project expenditures itemized by the following categories: planning & design; materials & equipment; freight; labor; project administration/overhead and other expenses.
- c. Acknowledgement of support: For all non-construction projects, the Award recipient shall include an acknowledgement of the Government's support for the project(s) developed under this Award. The allowable format shall be use of Denali

Commission logo on any printed materials referencing the emerging technologies program and mention in any public presentations. Costs associated with this requirement shall be paid out of the project funding received by the Award recipient from the Denali Commission.

9. Public Policy Laws and Assurances

Award Recipients are required to comply with the public policy laws and assurances on Standard Forms SF 424b. This form must also be signed by a certifying official of the organization. Some of the laws are highlighted below for your reference.

To the maximum extent practicable, considering applicable laws, Funding Recipients shall accomplish the project contemplated by the Award using local Alaska firms and labor.

No portion of this award may be used for lobbying or propaganda purposes as prohibited by 18 U.S.C. Section 1913 or Section 607(a) of Public Law 96-74.

Project level environmental reviews in accordance with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) are required for each project undertaken with Denali Commission funds.

10. Non-Compliance with Award Conditions

Recipients not in compliance with the terms and conditions of this Financial Assistance Award will be notified by the Denali Commission. The Denali Commission will work with the recipient to identify the steps necessary to bring them back into compliance, and will establish an appropriate time frame for the corrections to be made. If the corrections have not been made by the deadline, the Denali Commission reserves the right to either suspend or unilaterally terminate the Financial Assistance Award for non-performance.

11. Program Manager, Financial Manager & Other Contact Information

Denali Commission	Alaska Center for Energy and Power
Denali Daniels Program Manager 510 L Street, Suite 410 Anchorage, AK 99501 Phone: 907-271-1189 Fax: 907-271-1415 E-mail: ddaniels@denali.gov	Gwen Holdmann Project Manager 451 Duckering Building Fairbanks, Alaska 99775-5880 Phone: 907-590-4577 Fax: 907-474-6686 Email: gwen.holdmann@uaf.edu
Betty Sorensen Grants Administrator 510 L Street, Suite 410 Anchorage, AK 99501	Maggie Griscavage Financial Contact 3295 College Road, 109 ASC Fairbanks, AK 99775-7880

Phone: 907-271-3415 Fax: 907-271-1415 E-mail: bsorensen@denali.gov	Phone: 907-474-6446 Fax: 907-474-5506 Email: gmgiscavage@alaska.edu
--	---

12. Other Project Specific Paragraphs

In addition to reporting quarterly, ACEP shall meet twice annually with the Commission to report lessons learned and project status.